**Session 9- Surface Area and Volume**

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| Time | **Agenda**  **This lesson covers a lot of material. You may need to pick and choose what your class will benefit from the most. Adjust times as needed.** | Vocab | Resources |
| **4:00** | • **Welcome**   * Go over homework * Discuss the reading from Beckmann: Length, Area, Volume, and Dimension. Using the box each participant brought, describe the one-dimensional, two-dimensional, and three-dimensional parts or aspects of the box with a group.   **Surface Area and Volume**   * **The definitions of both surface area and volume must be solid before moving on. Have the participants define each and then create a list of when you would need a surface area measurement and when you would need to measure volume.** * **Beckmann Hardcover pg. 570 defines volume.** | Surface area  volume | Boxes |
| 4:30 | **Prisms and Cylinders Surface Area**   * Defining prisms and cylinders- The participants will use a Venn diagram to compare the attributes of a cylinder and a prism. They may want to use the info from the homework reading in Beckmann pp 554-557. * As the group is brought back together for a discussion, make sure the idea of **oblique** is addressed both for prisms and cylinders. | Prism  cylinder | Venn Diagram |
| 4:45 | **Nets Have a discussion to make sure all the participants know what a net is. The Geo Solids have nets in the box that are a good visual.**  **ACTIVITY- any of the following activities will work for nets. Choose which you prefer.**   1. **Beckmann Activity Manual pp 314-317 Class Activities 13g-13I.** 2. **Beckmann Hardcover pg 563-564, Practice Exercises (Use nets from the back of book.)** 3. [**http://www.uen.org/Lessonplan/preview.cgi?LPid=6107**](http://www.uen.org/Lessonplan/preview.cgi?LPid=6107) 4. **Using the NLVM website. Have the participants make nets using the Platonic Solids. Look at the solids and then draw the net.** [**http://nlvm.usu.edu/en/nav/category\_g\_3\_t\_3.html**](http://nlvm.usu.edu/en/nav/category_g_3_t_3.html) | Net | Geo-Solids  Beckmann books  Computer NLVM |
| **5:30** | **Link Nets to Surface Area**   * Using their boxes, the participants will now derive surface area formulas for rectangular prisms as they find the surface area of their box.      * The following website is a great graphic to use for volume and surface area. <http://www.shodor.org/interactivate/activities/SurfaceAreaAndVolume/?version=1.5.0_13&browser=Mozilla&vendor=Apple_Computer,_Inc> * **Alternative Activity: Practice with surface area.** [**http://www.aaastudy.com/geo.htm**](http://www.aaastudy.com/geo.htm) |  | Boxes |
| **6:00** | **Break** |  |  |
| **6:15** | **Volume of Prisms and Cylinders**   * Have participants read the bottom of pg 571 Beckmann hardcover titled, “The Volume Formula for Prisms and Cylinders.” * Class activities 13N & 13O will help make sense of volume for prisms and cylinders. (Activity 13N discusses Cavalier’s principle. Use the following website to model the principle and discuss #4) * **Cavalier’s Principle** http://www.jimloy.com/cindy/cavalier.htm * **Chart with volume formulas if needed** [**http://www.mathwords.com/v/volume.htm**](http://www.mathwords.com/v/volume.htm) * **Activity: Practice with volume now.** [**http://www.aaastudy.com/geo.htm**](http://www.aaastudy.com/geo.htm) | Prism  Cylinder  volume |  |
| 7:00 | **Pyramids and Cones (Surface area and Volume)**   * Defining pyramids and cones. The participants will use a Venn diagram to compare the attributes of a pyramid and a cone. Be sure the oblique cone and pyramid are covered as well throughout the discussion. Information in Beckmann Hardcover 555-557. * **Cone Surface Area Activity** Patterns for Cones- Beckmann Activity Book pg 317 * **Volume of Pyramid Activities: Time will not permit you to do all of the activities so choose the ones that bet suit your class.**  1. **Comparing the Volume if a Pyramid with the Volume of a Rectangular Prism.** Class Activity 13P Beckmann Activity Book pg 322 2. **The 1/3 in the Volume Formula for Pyramids and Cones** Class Activity 13Q Beckmann Activity Book pg 322-323 3. **Volume versus Surface Area and Height** Class Activity 13 T Beckmann Activity Book pg 325 |  | compass |
| 7:50 | **Homework:** Beckmann Hardcover pg 567-568 #2a &b & 5  **Reading:** Beckmann Hardback 545-546 (Pythagorean Theorem)  **Reflection Journal** |  |  |